

REMARKS

Please reconsider the application in view of the following remarks.

Disposition of Claims

Claims 10-12, 15, 17, 18, and 20-38 are pending in this application. Claims 28 and 30 were withdrawn by the Examiner as being directed to a non-elected invention. Claims 10, 21, 32, 33 and 35 are independent. The remaining claims depend, directly or indirectly, from claims 10, 21, 32, and 33.

Amendments to the Claims

Claims 21, 22, and 32 have been amended in this reply to remove unnecessary language. Specifically, the phrase “a thin cylindrical portion” has been amended to “a thin portion.” No new matter has been added by these amendments. Further, claims 33 and 34 have been amended to clarify the claimed invention. Support for these amendments may be found, for example, in claim 21 of the present application. Further, claim 35 has been amended to include all limitations of base claim 33.

Allowable Subject Matter

Applicant again thanks the Examiner for indicating that claim 35 contains allowable subject matter. Claim 35 has now been rewritten into independent form including all of the limitations of the base claim. Accordingly, withdrawal of the objection to claim 35 is respectfully requested.

New Claims

Claims 36-38 have been added to the present application by this reply. No new matter has been added by these claims, as support may be found in the previously presented claims.

Rejections under 35 U.S.C. § 103

Claims 10-12, 15, 17, 18, 20-22, 24-27, 29, and 31-34 stand rejected under 35 U.S.C. §103(a) as being obvious over U.S. Patent No. 6,155,376 (hereinafter “Cheng”) in view of the Japanese Final Office Action dated January 30, 2006 (hereinafter “JPFOC”). The rejection is respectfully traversed.

Independent Claims 10 and 33

Applicants have discovered, through detailed experiments and studies, that a presser member may loosen due to impacts and vibrations in an electrically driven power steering apparatus. According to independent claim 10, a presser member has a connecting device to limit the relative rotation between the presser member and the ball screw nut, even if a bonding force between the threads is lost, wherein the function of limiting the relative rotation is performed *after* the threads are fastened. The function of limiting the relative rotation is performed after the threads may be fastened by, for example, means of a shearing force of a resin member filled into communication holes respectively provided with the presser member and the ball screw nut or deforming part of the presser member toward the ball screw nut.

Independent claim 33 recites a method of manufacturing an electrically driven power steering apparatus, the method including engaging a thread of a presser member with a thread of a ball screw nut and deforming at least one part of a thin portion of the presser member

toward the screw nut so as to limit a relative rotation between the presser member and the ball screw nut *after* the engaging.

Embodiments of the present invention advantageously provide an electrically driven power steering apparatus and a method of manufacturing an electrically driven power steering apparatus wherein a pre-load and a rotation prevention allowance torque of the presser member is controlled within an adequate range.

Cheng discloses a lock nut (80). The lock nut of Cheng does not stop a relative rotation of the lock nut if a thread thereof loosens. Cheng is completely silent with respect to limiting relative rotation as claimed. Cheng does not show or suggest a connecting device capable of limiting a relative rotation between the presser member and the ball screw nut despite loss of a bonding force between the threads. Further, Chang fails to show or suggest the limiting a relative rotation being performed *after* the threads are fastened, as recited in independent claims 10 and 33.

The Examiner asserts that JPFOC discloses it would be obvious to one skilled in the art to “inhibit looseness by caulking a part of a nut to a bolt side.” (See the Office Action dated September 7, 2006). Applicant assumes the Examiner is asserting that inhibiting looseness by caulking a part of a nut to a bolt side suggests those limitations that Cheng fails to teach or suggest with respect to claims 10 and 33. Furthermore, Applicant respectfully notes that, as expressed in the present application and in response to the Final Office Action dated August 11, 2005, the term “caulking” means “plastically deforming.”

Applicant respectfully submits that the Examiner has improperly based this rejection on an assertion of the Japanese Examiner rather than a prior art reference. In JPFOC, the Japanese Examiner asserts that it would be obvious to inhibit looseness by caulking a part of a nut to a bolt side, but this is merely an assertion of the Japanese Examiner which is not based

on either of the two references cited in JPFOC. Neither the Japanese Examiner nor JPFOC qualify as prior art under U.S.C. §102. Thus, a rejection may not be based on this assertion made in JPFOC.

Furthermore, the claims in the Japanese application, which is a counterpart of the present application, have been amended similarly to the claims of the present application and allowed. Thus, the Japanese claims, similar to the present claims, were shown to be patentable over both of the prior art references cited. Applicant would be pleased to provide the Examiner with the Japanese claims and a translation thereof upon request.

Finally, as a prophylactic measure, in the event the Examiner asserts that it would be obvious to inhibit looseness by caulking (plastically deforming) a part of a nut to a bolt side, Applicant respectfully requests that the Examiner provide an affidavit to support that assertion pursuant to 37 C.F.R. § 1.104(d)(2).

In view of the above, Cheng and JPFOC, whether considered separately or in combination, do not teach or suggest all the limitations recited in independent claims 10 or 33. Thus, claims 10 and 33 are patentable over Cheng and JPFOC. Dependent claims are allowable for at least the same reasons. Accordingly, withdrawal of this rejection is respectfully requested.

Independent Claims 21 and 32

Claim 21 recites an electrically driven power steering apparatus comprising a presser member screwed to a ball screw nut for pressing a bearing against the ball screw nut. The presser member has a connecting device capable of limiting a relative rotation between the presser member and the ball screw nut by deforming at least one part of a thin portion toward the ball screw nut. The function of limiting a relative rotation is performed *after* the threads are fastened.

Claim 32 recites an electrically driven power steering apparatus including a housing, a ball screw shaft extending within the housing and connected to a steering mechanism, a motor having a rotor, a ball screw nut connected to the rotor of the motor, a bearing for supporting the ball screw nut so as to be rotatable with respect to the housing, and a presser member screwed to the ball screw nut for pressing the bearing against the ball screw nut. The presser member has a connecting device capable of limiting a relative rotation between the presser member and the ball screw nut by deforming at least one part of a thin portion toward the ball screw nut, thereby by limiting a relative rotation *after* the threads are fastened. The relative rotation between the presser member and the ball screw nut is limited by a frictional force exerted between the deformed part of the thin portion and the ball screw nut. The presser member has a female thread, the ball screw nut has a male thread engaged with the female thread, the presser member abuts the bearing rotatably supporting the ball screw nut, and the presser member has a part with which a tool for rotating the pressing member is engaged.

As noted above, the lock nut of Cheng does not stop a relative rotation of the lock nut if a thread thereof loosens. Cheng does not show or suggest a connecting device as recited in independent claim 32. Additionally, Cheng fails to show or suggest the limiting relative rotation being performed *after* the threads are fastened, as recited in independent claims 21 and 32.

The Examiner asserts that JPFOC discloses it would be obvious to one skilled in the art to “inhibit looseness by caulking a part of a nut to a bolt side.” (*See* the Office Action dated September 7, 2006). Applicant assumes the Examiner is asserting that inhibiting looseness by caulking a part of a nut to a bolt side suggests those limitations that Cheng fails to teach or suggest with respect to claims 21 and 32. The previous arguments with respect to claims 10 and 33 similarly apply to claims 21 and 32.

In view of the above, Cheng and JPFOC, whether considered separately or in combination, do not teach or suggest all the limitations recited in independent claims 21 or 32. Thus, claims 21 and 32 are patentable over Cheng and JPFOC. Dependent claims are allowable for at least the same reasons. Accordingly, withdrawal of this rejection is respectfully requested.

Dependent Claim 23

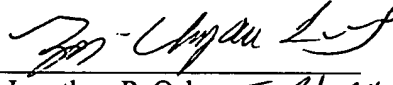
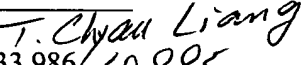
Claim 23 stands rejected under 35 U.S.C. §103(a) as being obvious over Cheng as modified by JPFOC, and further in view of U.S. Patent No. 5,000,636 (hereinafter "Wallace"). Claim 23 is dependent on claim 21, and Wallace fails to teach that which Cheng and JPFOC lack with respect to claim 21. Accordingly, withdrawal of this rejection is respectfully requested.

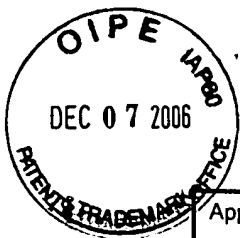
Conclusion

Applicant believes this reply is fully responsive to all outstanding issues and places this application in condition for allowance. If this belief is incorrect, or other issues arise, the Examiner is encouraged to contact the undersigned or his associates at the telephone number listed below. Please apply any charges not covered, or any credits, to Deposit Account 50-0591 (Reference Number 10122/005002).

Dated: December 7, 2006

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